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ABSTRACT

The paper summarizes results of time-in-motion studies on 259 mildly to severely mentally retarded clients in programs for the developmentally disabled (mean ages 11-42 years old). The study was part of an effort to determine staff utilization patterns and costs associated with the delivery of each of 40 habilitation/training packages developed from functional skill assessment in eight domains of motoric skills, dressing/grooming, toileting, eating, language, reading/writing, quantitative, and independent living. Care or training activities for each client were recorded for 24 hours per day over 5 days. Data were analyzed according to three staff position categories: direct care personnel, licensed personnel, and support personnel. Data are presented for the percent of care or training performed by specific staff position and direct costs of care and training in each of the eight domains. (CL)

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THE COST OF CARE AND TRAINING WITHIN FACILITIES FOR THE DEVELOPMENTALLY DISABLED

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The third goal of the Office of Health Finance Project involved developing a habilitation-training approach for developmentally disabled persons that can be used for state-level planning and funding. This goal has two objectives including: (1) grouping clients into levels that reflect an individual profile of measured behavioral competence and habilitation needs; and (2) developing Habilitation/Training Packages that present the training focus, entry behavior, suggested or exemplary behavioral objectives, exit behaviors, and care-training times for each cell within the Habilitation Matrix.

In reference to the first objective, functional skill domains, which are identified by the items on the Illinois Client Information System (ICIS) 1010 A, include motoric, dressing/grooming, toileting, eating, language, reading/writing, quantitative, and independent living. To establish manageable levels of behavioral functioning, each domain is divided into 4, 5, or 6 levels, ranging from total dependence (Level 1) to approximations of total independence (Level 6). Each level is descriptive of the behavioral competence displayed by an individual within that behavioral domain. Further, these classes are bounded by "entry" and "exit" criteria representing items from the ICIS 1010 A (MDPS). Those criteria were developed from statistical and clinically based analyses of completed ICIS assessments. These levels are

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listed along the left side of the Habilitation Matrix (see Table 1).

Refer to Table 1

The second objective involved developing 40 Habilitation/Training Packages, each of which presents the training focus, entry behavior, suggested or exemplary behavioral objectives, exit behavior, and proposed care-training times. An example is presented in Figure 1.

Refer to Figure 1

Once the care and training packages were developed, then time-in-motion studies could be done to complete the fourth step of the project, namely determining staff utilization patterns and costs associated with the delivery of each habilitation program or package. The purpose of today's presentation is to present time-in-motion data from Nebraska and Illinois that address three questions.

1. How much time per day by staff position is devoted to client care and training?
2. Who does the care and training?
3. How much does it cost?

METHOD

Subjects

The study involved time-in-motion studies on 259 clients in programs for the developmentally disabled in Nebraska and Illinois. The facilities and client characteristics are summarized in Table 2.

TABLE 1
HABILITATION MATRIX
(Training Levels by Behavioral Domains)

Level	Behavioral Domains and Training Area Descriptors							
	Motoric Development	Dress/ Groom	Toileting	Eating	Language	Read/ Write	Quantitative	Independent Living
1	Position Tolerance and Head Control	Bilateral Motor Control	Bowel and/or Bladder Control	Reaching and Grasping	Visual/ Auditory Attending	Eye-Hand Coordination	Concept Development	Attending Skills
2	Body Balance & Equilibrium	Dress & Groom with Assistance	Toilets with Assistance	Eats with Assistance	Expresses Needs or Feelings	Perceptual motor Development	Matching, Sorting & Discrimination	Constructive Use of Leisure Time
3	Standing	Independent Dressing & Grooming	Independent Toileting	Independent Eating	Receptive Language Development	Elementary Writing/ Printing	Number Naming and Counting	Meal Preparation & Home Living Skills
4	Ambulation	Personal Hygiene	Generalization Training	Community Access/ Social Skill Training	Expressive Language Development	Advanced Reading & Writing Skills	Elementary Quantitation Usage	Community Awareness & Access
5	Perceptual Motor Integration	Personal and Clothing Maintenance			Language Generalization	Functional Vocabulary	Basic Money & Time Concepts	Independent Community Use
6	Adaptive Physical Education						Independent Money Usage	

Figure 1

SAMPLE HABILITATION/TRAINING PACKAGE

LEVEL 1: MOTORIC DEVELOPMENT

Training Focus: Position Tolerance and Head Control

Entry Behavior: Reflexes Inhibited

Suggested Behavioral Objectives:

Person will:

1. maintain a supported supine position
2. maintain a supported prone position
3. maintain a supported side-lying position
4. maintain a supported sitting position
5. maintain a supported standing position
6. turn his/her head from left to right and right to left in a supine and in a prone position
7. lift and hold his/her head upright while in a supine, prone and supported sitting position
8. support the weight of his/her head and trunk on his/her forearms and also using his/her hands with his/her arms extended while maintaining a prone position
9. lift his/her head and trunk from the floor supporting his/her weight on his/her forearms and also using his/her hands with his/her arms extended while a prone position
10. turn his/her head from left to right and right to left while supporting the weight of his/her head and trunk on his/her forearms and also using his/her hands with his/her arms extended

Exit Behavior: Can be positioned for a minimum of five minutes while maintaining head control.

	CARE			TRAINING		
Function	Position	Ave.Hr. Wage	Time[a]	Position	Ave.Hr. Wage	Time[a]
Passive Excercises	Lic.Phys. Ther. Aide/Tech.		1 10	Lic.Phys.Ther. Aide/Tech.		9 83
Range-of-Motion	Lic.Phys. Ther. Aide/Tech.		1 5	or Habil. Spec.		
Positions	Lic.Phys. Ther. Aide/Tech.		1 30			

[a] Minutes/Day

Refer to Table 2

Procedure

Care or training activities for each client were recorded for 24 hours per day, for 5 days. Times reported by shift included all care and training activities performed by the in-house staff. The total minutes of either care or training per ICIS domain were summed per staff position per client for each of the 5 days. These are the data that were used in subsequent analyses and in today's presentation. The definitions used in the study are contained in Table 3.

Refer to Table 3

Table 4 lists the in-house staff positions. In determining projected costs,

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Refer to Table 4

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it is important to note that mean hourly wages for the current fiscal year were the datum used. Additionally, fringe benefits and administrative costs were not included. Table 5 and 6 present examples of the data collection forms.

Refer to Tables 5 and 6

Table 2

FACILITY AND CLIENT CHARACTERISTICS

	Number in Sample	Mean Age	Mean IQ
Nebraska			
ICF/MR	29	11	Profound
Community Based Program	144	42	50
Illinois			
ICF/DD	10	33	39
Community Living Facility	22	27	61
Child Care Facility	12	15	27
Skilled Nursing Facility	10	11	Profound
Grant-In-Aid	25	23	33
Specialized Nursing Center	7	25	Severe

Table 3

DEFINITIONS USED IN TIME-IN-MOTION STUDIES

Care Time. Care involves the direct contact of the client by staff efforts and/or activities are directed at maintaining the client (i.e., functions the client cannot do for himself or functions to make the client comfortable). For example, toileting and feeding require direct contact with the client. Care activities pertain only to the first four areas of development (Motoric Development, Dress/Groom, Toileting, Eating).

Training Time. Training is the structured IHP-related systematic staff efforts and/or activities directed toward the movement of the client to the exit criterion of each level. The exit criterion for each level of each area of development is given on each page of the level/area descriptions. Training activities pertain to all eight habilitation areas listed in Table 1. Structured IHP-related client training should have the following characteristics.

a. Written procedures.
b. Data recording procedures.
c. Formally stated objectives/goal (Individual Program).

Staff Time (Minutes Per Day). Staff time is the amount of actual client contact by each staff member with each client per day to perform the care activities and/or training time activity, doing it, and also the recording of such data, but this should be the time per client per day based on a seven-day week. If two staff in the position are involved, multiply by two. If another position is involved, pro-rate the times according to each position's daily contact with the client.

Staff Position Types.

Direct Care Personnel represents Aide/Technician, Non-Certified Teacher, Counselor, Habilitation Specialist or Recreational Therapist.

Licensed Personnel represents Licensed Practical Nurse, Registered Nurse, Certified Speech Clinician, Registered Occuptional Therapist, Licensed Physical Therapist or Certified Teacher.

Support Personnel represents Registered Social Worker, Psychologist, Behavior Specialist, or Dietician.

Table 4

IN-HOUSE STAFF POSITIONS

1.	Registered Nurse
2.	Licensed Practical Nurse
3.	Aide/Technician (including child case-worker, non-certified O.T./P.T. aides)
4.	Registered/Certified Social Worker
5.	Licensed Speech Clinician
6.	Registered Occupational Therapist
7.	Licensed Physical Therapist
8.	Psychologist
9.	Counselor - case worker (include case manager, BA level social worker)
10.	Physicians
11.	Certified Teacher
12.	Non-Certified Teacher
13.	Behavioral Specialist[a]
14.	Recreational Therapist
15.	Habilitation Specialist (including Training Supervisor)[b]
16.	Dietician
17.	Certified P.T./O.T. Aide

[a] BA or MA Specialist in behavior modification. This person delivers the programming and may be involved in the development of the program. Programming deals with either negative behaviors or skill acquisition.

[b] Technician 4 or 5 level. This person delivers the programs and may be involved in the development of the program, but is not responsible for them. Programming usually focuses on skill acquisition.

Table 5

DAILY DATA COLLECTION FORM: CARE TIMES AND STAFF POSITIONS

Day #:_____ Date_____ Facility Name_____

Client's First Name_____ Responsible Person_____

ID # (DMH, Facility #)_____ Shift _____

Care Function[a]	Staff Position	Minutes on Occasion[b]	Total Minutes for Shift
1. Passive Exercises			
2. Range-of-Motion			
3. Positioning			
4. Dressing/Undressing			
5. Washing Hands & Face			
6. Bathing			
7. Brushing Teeth			
8. Trimming Nails			
9. Providing Menstrual Aids			
10. Washing Hair			
11. Combing Hair			
12. Shaving/Make-Up			
13. Diapering			
14. Toileting			
15. Feeding (Mouth)			

[a] Assumes 1:1 Staff/Client Ratio (if 2 staff in the same position are involved, multiply by two; if another position, include that as well).

[b] Transfer Time: Setting client (example, bed to chair) is included in the "minutes on occasion." Preparation Time: Preparation such as getting materials, putting materials away, cleaning up, plus recording time is also included in the "minutes on occasion."

Table 6

DAILY DATA COLLECTION FORM: IHP - STRUCTURED
TRAINING TIMES AND STAFF POSITIONS

Day #: _____ Date_____ Facility Name_____

Client's First Name_____ Responsible Person_____

ID # (DMH, Facility #) _____ Shift _____

Training Domain[a]	Staff Position	Minutes on Occasion[b]	Total Minutes For Shift
1. Motoric Development			
2. Dress/Groom			
3. Toileting			
4. Eating			
5. Language			
6. Read/Write			
7. Quantitative			
8. Independent Living			

[a] Keyed to Table 1. Use the exemplary behavioral objectives within the Habilitation/Training Packages to determine into which domain the training times should be placed.

[b] Includes time required to prepare for the training activity, doing the activity, and data recording.

Results

The data reported today are based on the mean care or training times for each client across the eight ICIS domains. Individual matrix cell data were collected, but are not reported here. As previously defined:

Care. Staff efforts and activities performed (that is, direct contact) for the client to keep the person functional. These activities include staff effort that is necessary if the person cannot perform the behavior on his own, and involve the care that is needed to get through the day at a modicum of comfort. Care activities pertain only to the first four domains listed in Table 1, namely Motoric Development, Dress/Groom, Toileting and Eating.

Training. Systematic staff efforts and activities directed at movement toward the exit criterion of a particular cell in Table 1. The focus of training activities is on skill acquisition and/or retention, obtaining behavioral objectives, or the movement of a client toward the exit criterion. Training activities pertain to all eight domains listed in Table 1 and have the following characteristics: (1) written procedures; (2) data recording procedures; and (3) formally stated objectives/goals (Individualized Program).

Time: The amount of time per day required to perform care activities for the client ("Care Time") or the amount of time per day devoted to systematic efforts at skill acquisition, obtaining behavioral objectives, or movement toward the exit criterion ("Training Time"). Training time includes time required to prepare for the training activity, doing the activity, and data recording.

For ease and clarity of presentation, the data were aggregated into the following staff position categories:

Direct Care Personnel represents Aide/Technician, Non-Certified Teacher, Counselor, Habilitation Specialist or Recreational Therapist.

Licensed Personnel represents Licensed Practical Nurse, Registered Nurse, Certified Speech Clinician, Registered Occupational Therapist, Licensed Physical Therapist or Certified Teacher.

Support Personnel represents Registered Social Worker, Psychologist, Behavior Specialist, or Dietician.

Since we were using data from two different states, it was necessary to determine their ordinal relationships. A series of Pearson-Product Moment correlations were computed that generally indicated that the two sets of data were significantly correlated. Specific correlations are presented in Table 7. Because of the significant relationships, data from the two

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Refer to Table 7

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states were combined in Table 8 and Figures 2 and 3.

Table 8 summarizes the percent of care and training performed by specific

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Refer to Table 8

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staff positions. It is interesting to note two things about the data summarized in Table 8. First, the ordinal position is the same for care and training for aide-technician, non-certified teacher, and habilitation specialist. The second thing to notice is the high percentage of both care and training that was performed by these three types of direct care personnel (84 percent of the care and 54 of the training).

Table 7

PEARSON PRODUCT-MOMENT CORRELATIONS BETWEEN ILLINOIS AND NEBRASKA CARE AND TRAINING TIMES

Care Times (Domains 1-4)	Correlation	Probability
Direct Care Personnel[a]	.73	<.01
Licensed Personnel[b]	.17	>.05
Support Personnel[c]	Insufficient Data	
Training Times (Domains 1-8)		
Direct Care Personnel	.32	$p<.05$
Licensed Personnel	-.01	$p>.05$
Support Personnel	Insufficient Data	
Total Times[d]		
Care	.46	$p<.05$
Training	.33	$p<.05$

[a] Direct Care Personnel (DCP): Represents Aide/Technician, Non-Certified Teacher, Counselor, Habilitation Specialist or Recreational Therapist.

[b] Licensed Personnel (LP): Represents Licensed Practical Nurse, Registered Nurse, Certified Speech Clinician, Registered Occupational Therapist, Licensed Physical Therapist or Certified Teacher.

[c] Support Personnel (SP): Represents Registered Social Worker, Psychologist, Behavior Specialist, or Dietician.

[d] Collapsing over staff positions.

Table 8

PERCENT[a] OF CARE AND TRAINING PERFORMED
BY SPECIFIC STAFF POSITIONS

Position	Care	Training
Aide-Technician	65	29
Non-Certified Teacher	10	13
Habilitation Specialist	9	12
Teacher	5	9
Social Worker	5	1
Registered Nurse	3	2
Licensed Practical Nurse	2	0
Counselor	1	14
P.T./O.T. Aide	0	2
Occupational Therapist	0	1
Recreational Therapist	0	10
Speech Clinician	0	1
Dietician	0	3

[a] Percent of total care or training time

The same picture is presented in Figure 2 that shows graphically

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Refer to Figure 2

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the minutes per day of care and training performed by the three types of staff positions across the eight ICIS domains.

Figure 3 summarizes the direct costs of care and training per day for

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Refer to Figure 3

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each of the ICIS domains. These costs were computed using the following average hourly wage per type of staff position:

Direct Care Personnel: $5.81 ($0.67)

Licensed Personnel: $10.20 ($1.69)

Support Personnel: $11.23 ($3.31)

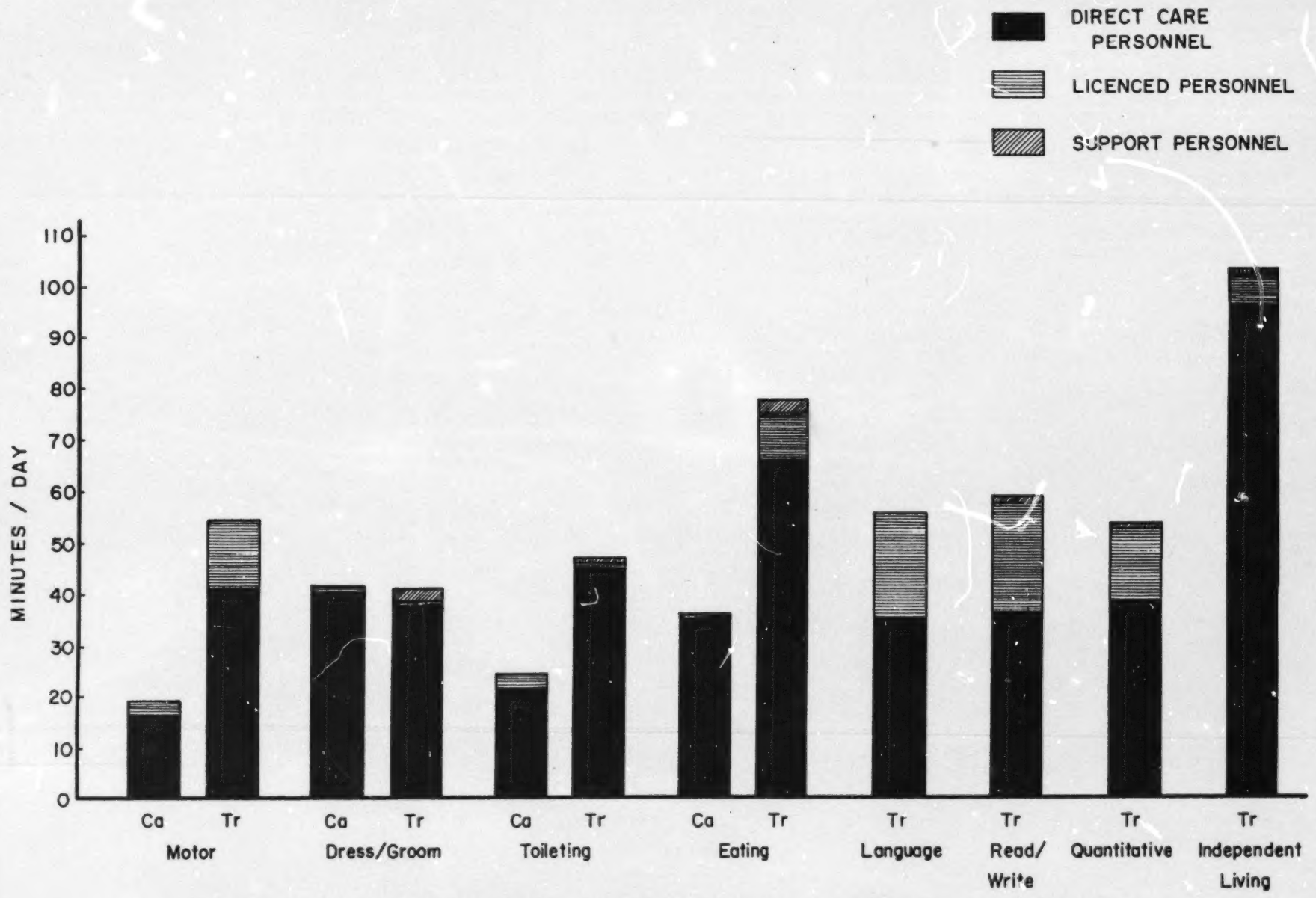

FIGURE 2. CARE/TRAINING TIME PER STAFF POSITION AND DEVELOPMENTAL DOMAIN

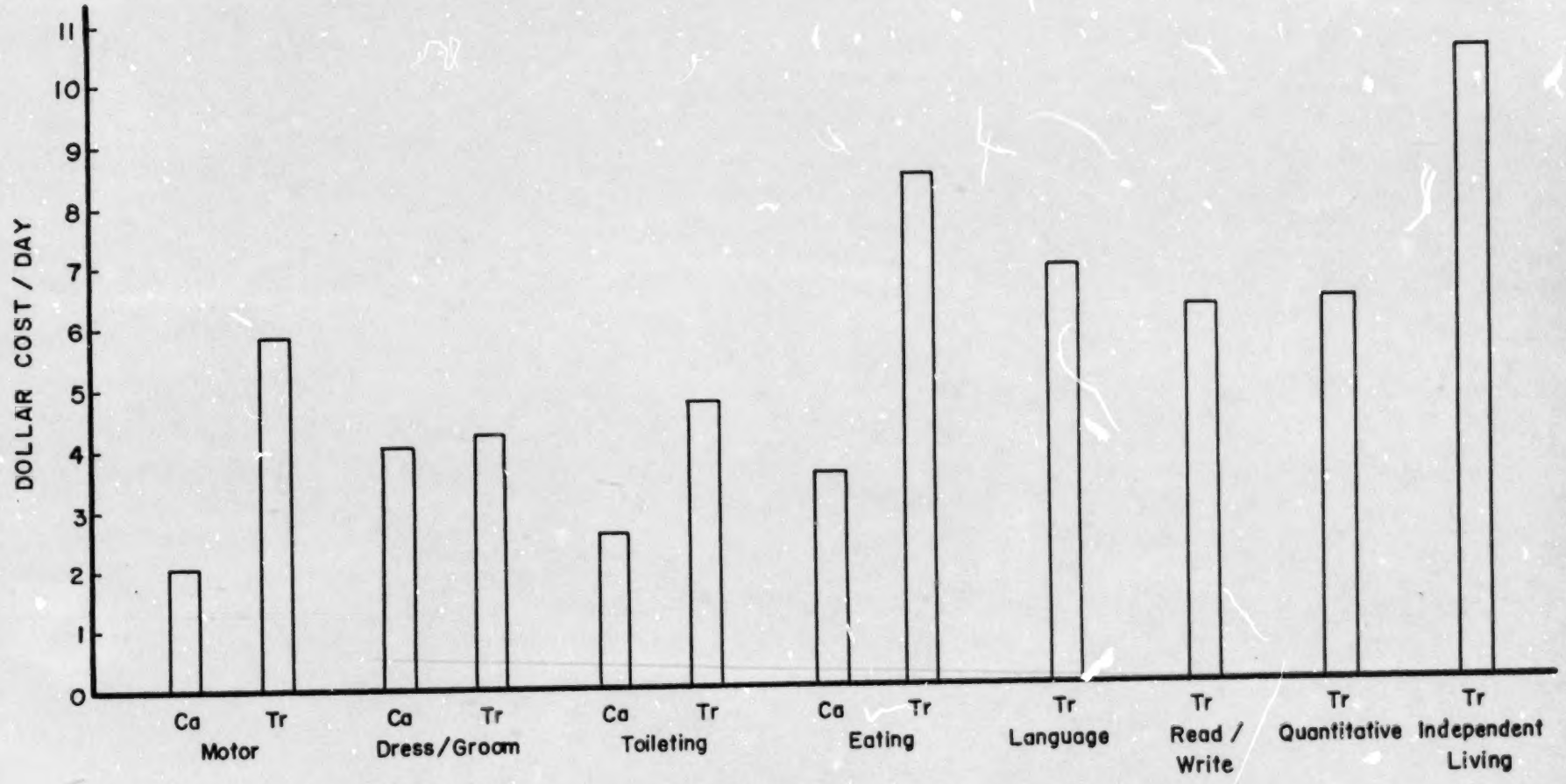

FIGURE 3. CARE/TRAINING DAILY DIRECT COSTS PER DEVELOPMENTAL DOMAIN

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